BOTANY.[1]

THE GRASSES OF MAINE.—Under this title Professor Fernald, of the Maine State College, has brought out a neat pamphlet of seventy pages and forty plates. It is designed for the use of the author's students, as well as for the farmers of the State. In the introduction is given a general description of the structure of grasses, with a pretty complete list of the technical terms used in ordinary descriptive works, and a couple of pages on the composition of grasses. An analytical key precedes the descriptive portion of the book, the latter occupying about fifty pages. Common names and the pronunciation of the scientific names are given in every case. The descriptions are much simplified, and appear to be fairly accurate. Short notes upon their agricultural value follow each species. Eighty-one species belonging to thirty-eight genera are described, and of these forty-two species are figured in the plates borrowed from the department of agriculture at Washington.

THE SPECTRUM OF CHLOROPHYLL.—When a ray of white light which has passed through a coloring-matter, for instance, a solution of one of the coal-tar dyes, red wine, or a solution of chlorophyll, is examined by means of a spectroscope, certain dark bands, known as absorption-bands, are observed at definite places in its spectrum. For convenience in examining the spectra of small amounts of coloring matters, a direct vision spectroscope attached to the tube of a microscope is employed, and the coloring-matter in question is placed in a flat-walled bottle or a glass cell on the stage of the microscope. The ray of light which is reflected from the mirror under the stage passes first through the colored matter, next through the objective, and lastly through the prisms which compose the microspectroscopic attachment to the tube.

In order to compare the spectra of different substances, a second prism or set of prisms is often used, by which the spectrum of a second liquid can be projected by the side of that of the first. The spectra of chlorophyll solutions from two different sources can thus be at once compared. One of the combinations can also be employed to project the solar spectrum (unchanged by passing through any color whatever), and its constant lines (Fraunhofer's lines) can be used for the determination of position of the bands seen in the spectrum of the liquid by its side.

The spectra of many substances, among which chlorophyll occupies a prominent place, have absorption-bands of such constancy in position and appearance that they are justly regarded as characteristic. The spectrum of an alcoholic solution of chlorophyll has been shown to be essentially the same as that of the chlorophyll granule itself. In order, however, to obtain all

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the absorption-bands characteristic of chlorophyll, it is necessary to examine successively solutions of different degrees of strength, some of the bands appearing only in dilute, and others only in strong solutions.—*G. L. Goodale, in Bot. Text-Book.*

THE TREATMENT OF SETS OF BOTANICAL SPECIMENS.—In this day, when so many sets of plants are distributed by the many collectors and elaborators of groups, it becomes a serious question what to do with them in the herbarium. A single set, or even a few sets may be kept in the original form and consulted in this way, but when one has to ransack a dozen or more fascicles, in as many different sets, in order to make a comparison of the species of a particular genus, the trouble is entirely too much for a busy man. One dislikes to tear up his sets of Ellis' North American Fungi, Thuemen's Mycotheca Universalis, Linhart's Ungarns Pilze, Wittrock and Nordstedt's Algæ aquæ dulcis exsiccatæ, Rabenhorst's Algæ Sachsens and Algæ Europas, etc., etc., but really the labor of running over the numerous fascicles makes any other course impracticable. In the herbarium of the University of Nebraska, all sets of plants, of whatever groups, are cut up and distributed. The labels in all cases are distinctive, indicating with certainty the set to which each specimen belongs, and its serial number. Any specimen can thus be as readily referred to as if it were retained in the original fascicle, while the ease of consultation and comparison is greatly enhanced.

BOTANICAL NOTES.—The botanical portion of the second annual report of the Wisconsin Agricultural Experiment Station, by Professor Trelease, is mainly devoted to the spot-disease of strawberry leaves (*Ramularia tulasnei*). Three figures serve to make the descriptions much more easily understood, although the text is admirably clear. A paper of this kind is worth more than scores of pages of so-called "experiments," which too often constitute the bulk of the reports from American experiment stations.——J. G. Baker's synopsis of the genus Selaginella, which has been running through the *Journal of Botany* for many months, is brought to a close in the October number. The whole number of species described is 312, of which 105 are here described for the first time.——B. M. Everhart, of West Chester, Pa., has compiled an alphabetical index to the species of the first fifteen centuries of Ellis' North American Fungi. It will prove of great service to all who have occasion to refer to Ellis' specimens. From it we find that there are in the fifteen centuries thus far published twenty-five species of Peronospora, eighty of Puccinia, twenty-eight of Uromyces, fourteen of Ustilago, forty-seven of Polyporus, eighty of Peziza, etc., etc.——Professor Beal has published in Bulletin No. 5, of the Michigan Agricultural College, the results of experiments made upon the vitality of seeds, from which it appears that of seeds enclosed in sand in bottles and

buried twenty inches below the surface of the soil, at the end of five years the following per cents grew, viz: Of *Amarantus retroflexus*, forty-two; *Ambrosia artemisiæfolia*, none; *Brassica nigra*, none; *Bromus secalinus*, none; *Capsella bursa-pastoris*, one hundred; *Lepidium virginicum*, ninety-four; *Erechthites hieracifolia*, none; *Euphorbia maculata*, none; *Lychnis githago*, none; *Anthemis cotula*, fifty-two; *Malva rotundifolia*, two (?); *Œnothera biennis*, eighty-two; *Plantago major*, none; *Polygonum hydropiper*, six; *Portulaca oleracea*, thirty-eight; *Quercus rubra*, none; *Rumex crispus*, ninety; *Setaria glauca*, sixty-eight; *Stellaria media*, seventy-two; *Thuja occidentalis*, none; *Trifolium repens*, four; *Verbascum thapsus*, eighty-four.——From the proceedings of the U. S. National Museum, we have a list, by Frank H. Knowlton, of the plants collected by C. L. McKay in Alaska, in 1881. In all 122 species are enumerated, distributed as follows, viz: Dicotyledons, eighty-seven; Monocotyledons, twenty-four; Conifers, one; Pteridophytes, five (one Equisetum, one Lycopodium, three ferns); mosses, four; lichens, one. No new species are described.——Professor Penhallow published, in the *Canadian Record of Science* for October, a paper upon the distribution of the reserve-material of plants in relation to disease, from which it appears that an abnormal storage of starch in the pith, wood and bark of the peach is associated with a deficiency of potash and chlorine and an excess of lime. This abnormal storage is accompanied apparently by imperfect nutrition, due to the loss of power of the tissues to dissolve the starch, which accordingly accumulates.——The July *Torrey Bulletin* contains a paper by Professor Trelease showing that the fungus parasitic on *Juncus tenuis*, and hitherto known as *Ustilago junci* Schweinitz, is properly not an Ustilago at all, but a species of Cintractia. Accordingly it must hereafter be known under the name of *Cintractia junci* (Schwein.) Trelease. The only other known species of the genus is *C. axicola* (B) Cornu, from the southern United States and the West Indies.——From a study of the development of the leaves of *Pinus monophylla* and *P. edulis* upon young trees growing upon his grounds in Germantown, Pa., Thomas Meehan concludes that the former is a depauperate state of the latter. His paper appears in the August *Torrey Bulletin*.——The "Association Number" of the *Botanical Gazette* (Sept. and Oct.) contains forty-six pages of interesting matter. We are much pleased to read the announcement that beginning with the new year the size of this indispensable journal will be increased to at least twenty-four pages per month. An exhaustive index to volumes I to X will be published at the close of the present year. ——Professor John M. Coulter's Rocky Mountain Flora is in press, and will soon appear. It is to be uniform with Gray's and Chapman's Manuals, and will include descriptions of the plants from about the 100th meridian westward, and extending from British America southward through Colorado.